Abstracts

Frequency-Domain TLM Analysis of the Transition from Rectangular to Circular Waveguides

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This paper presents a rigorous analysis and design of various transitions between rectangular and circular waveguides. Three types of transitions are presented: An abrupt transition, a tapered transition consisting of cascaded sections of circular waveguide with increasing (decreasing) radii, and a ridged waveguide transition. The latter one has never been analyzed in the literature before, but is potentially the most effective transition because for its ease of manufacturing. The numerical analysis is based on the frequency-domain TLM (FDTLM) method using a graded rectangular mesh arrangement. A comparison with other techniques and measurements validates the approach taken. The typical return loss values achieved without optimizing the structures ranges, for most of the transitions investigated, between 15 to 25dB.

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